factors for PVCs-induced cardiomyopathy. Based on the result of long term successful RFCA, we divide cardiomyopathy patients into two groups: Group Success (n=4) and Group Failure (n=4). Two groups show no significant difference in the PVCs burden and the LVEF before RFCA. The PVCs burden decreases significantly from 24.86%± 12.00 to 0.00±0.00 in Group Success (p <0.05) when the PVCs burden decreases insignificantly from 26.67%±11.51 to 19.38%±0.00 in Group Failure (p>0.05). The LVEF increases significantly from 40.50%±7.01 to 57.00%±10.15 in Group Success (p>0.05) when the LVEF stay similar from 40.25%±5.12 to 42.00%±11.52 in Group Failure (p <0.05). The PVCs burden can be reduced by the successful RFCA and therefore improve the heart function (p > 0.05.)

CONCLUSIONS PVCs burden>20% and PVCs history over 15 years are both independent risk factors for the frequent PVCs induced-cardiomyopathy. RFCA is an effective treatment to decrease the number of PVCs and improve the LVEF value.

NON-INVASIVE CARDIAC ELECTRICAL INSPECTION

GW26-e4753

Prediction of cardiac mortality after acute myocardial infarction using support vector machine based on heart-rate dynamics

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OBJECTIVES To investigate the warning power of support vector machine (SVM) model based on heart-rate dynamics for prediction of cardiac death after acute myocardial infarction (AMI).

METHODS A total of 226 AMI patients were admitted to First Affiliated Hospital of Harbin Medical University from January 2009 to December 2009. Multivariate heart-rate dynamics parameters such as heart-rate variability (HRV), deceleration capacity of heart rate (DC) and acceleration capacity of heart rate (AC) extracting from Holter monitoring within two weeks after AMI were analyzed. The SVM model based on electrical parameters is established and machine learning and classification were analyzed based on the results of following-up. The classification results compare with left ventricular ejection fraction (LVEF), R-R interval standard deviation (SDNN) and DC. By using the area under the receiver operating curve (AUC) to evaluate the various tools and warning capability, and multivariable logistic regression analysis and Kaplan-Meier survival analysis were used too.

RESULTS During a mean follow-up of 28 months, cardiac death was 12, and finally a total of 208 patients were included in the analysis, including 150 males, 58 females. We evaluated SVM algorithm for integrating various electrocardiographic features based on 8 dimension heart-rate dynamics indices. Mean AUC of SVM model was 0.858, compared with 0.742 (P<0.01) for LVEF, 0.793 (P<0.05) for SDNN and 0.740 (P<0.01) for DC, respectively. Multivariable logistic regression analysis revealed that the relative hazard risk (HR) of SVM model was 30.291 (95%CI, 3.664～250.424) after correcting the variety of clinical and electrical variables. Kaplan-Meier analysis revealed that the model of SVM for negative survival rate is higher than the positive (P<0.01).

CONCLUSIONS SVM prediction model based on heart-rate dynamics is valid and effective for prediction of cardiac death after AMI and leads to higher prediction accuracy than traditional tools.

GW26-e2164

Heart Rate Changes in Patients with Acquired Long QT Syndrome

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OBJECTIVES Our recent studies revealed that acquired long QT syndrome (ALQTS) is much more common than previously thought. Understanding the pathophysiology of ALQTS is very important for risk stratifications. This study therefore investigated heart rate (HR) changes in patients with ALQTS.

METHODS A retrospective medical records review was conducted in hospitalized patients including 437 ALQTS and 639 age- and sex-match control subjects. The ALQTS group was consisted of 1) 293 patients with QTc≥ 500 ms caused by various reasons such as using QT-prolonging drugs, presence of electrolytes imbalance etc. 2) 144 long QT patients associated with left ventricular hypertrophy due to essential hypertension (HTN-LVH). HR at resting state was evaluated with medications such as beta-blockers that could alter HR taken into considerations. Echocardiographic measures such as left atrial diameter (LAD), left ventricular end-diastolic diameter (LVEDD) and ejection fraction (EF) were also assessed for patients in two groups.

RESULTS HR was faster in ALQTS subjects with markedly prolonged QTc compared to the control group (88±19 bpm vs. 75±15 bpm, p <0.0001). Left atrial and ventricular remodeling were more apparent in ALQTS subjects reflected by larger LAD (38±6 mm vs. 36±5 mm, p < 0.001), larger LVEDD (48±8 mm vs. 46±7 mm, p < 0.05) and a lower EF (0.53±0.1 vs. 0.55±0.09, p < 0.05), respectively. In the HTN-LVH group, more patients with ALQTS were prescribed with beta-blockers than those showing a normal QT (49% vs. 33%, p < 0.05). Nevertheless, HR was still faster in the ALQTS subjects (73±11 bpm vs. 66±10 bpm, p < 0.0001).

CONCLUSIONS Patients with ALQTS have a faster heart rate. Impaired cardiac function and structural remodeling may be the fundamental causes in patients with structural heart diseases. Determining the alterations in autonomic nerve system that modulates heart rate variability is awaited for further investigations.

GW26-e2440

Deceleration Capacity of Heart Rate in 34 Patients with Brainstem Tumor

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OBJECTIVES To explore the characteristics of deceleration capacity of heart rate (DC) in patients with brainstem tumor and its relationship with tumor site, pathology and postoperative recovery.

METHODS Thirty-four patients of brainstem tumor in Beijing Tiantan Hospital (research group, aged 15-45) and 40 health subjects (control group, aged 15-45) were enrolled in this study. The patients were divided into three couples of matching subgroups according to the tumor site, pathology and postoperative recovery: demarcated by the intermediate transverse section of mesencephalon, all patients were divided into subgroups S1 (low brainstem tumor, n=21) and subgroups S2 (high brainstem tumor, n=13); malignant tumor (subgroups P1, n=19) and benign tumor (subgroups P2, n=15); 25 patients with good recovery and transferred from intensive care unit (ICU) to neurosurgery ward within 5 days after operation composed subgroups R1, while those who left ICU over 5 days composed subgroups R2 (n=9), including poor-recovery patients, such as those of death and requiring a tracheotomy. The 24-hour electrocardiographic (ECG) Holter monitoring was performed in all subjects. DC indexes were compared between two groups and each matching subgroups. All the statistical analyses were performed through the SPSS 19.0. Besides, P<0.05 was considered as statistically significant.

RESULTS DC index was 7.12 ± 2.56 ms in the research group and 10.12 ± 3.21 ms in the control group, the difference was statistically significant, P <0.05. DC of subgroups S1 was different with that of subgroups S2 (5.26 ± 2.83 ms vs 8.83 ± 1.58 ms, P <0.05). Subgroups P1 was significantly lower than subgroups P2 (6.46 ±1.56ms vs 7.50 ±2.07 ms, P <0.05). Subgroups R1 had a higher DC than subgroups R1 (7.61 ± 31.58 ms vs 5.76± 1.45 ms, P <0.05).

CONCLUSIONS DC is lower in the patients with brainstem tumor. The factors including tumor site and pathology affect DC which is also possibly associated with the postoperative recovery. DC could be a new prognostic indicator for patients with brainstem tumor which is worthy of further clinical research.

GW26-e0742

Assessment of the left atrial appendage structure and function of the non-valvular atrial fibrillation by real-time three-dimensional transesophageal echocardiography

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OBJECTIVES Thromboembolic events are the major lethal cause of atrial fibrillation (AF). Accurately estimating the thromboembolic risk

and offering patients appropriate prevention is essential for AF patients. The left atrial appendage (LAA) represents one of the major sources of cardiac thrombus in patients with AF. This study investigated the morphology, structure and hemodynamic characteristics of the LAA by real-time three-dimensional transesophageal echocardiography (RT3D-TEE) in AF patients and controls. This study also tried to investigate whether these RT3D-TEE parameters predict the thromboembolic risk of AF patients.

METHODS Two-hundred twenty two non-valvular AF patients and 62 controls who underwent RT3D-TEE during December 2012 to January 2014 in West China Hospital were enrolled in the study. Of the 222 patients, 189 AF patients also received enhanced cardiac CT scan. The orifice size, orifice area, depth, volumes measurement of the LAA were completed in Philip QLAB 9.0 and Siemens Syngo MMW workbench. Differences in morphology, structure and hemodynamic characteristics of the LAA were compared between AF patients and controls, among different $CHADS_2$ thromboembolic risk subgroups, and between thromboembolic events and non-events group. In addition, logistic regression analysis was used to identify whether these parameters predict thrombotic events independent of the $CHADS_2$ score in AF patients.

RESULTS Compared with controls, AF patients had significantly bigger orifice size, orifice area, end-diastolic volumes and lower emptying rate. Orifice size, orifice area, end-diastolic volumes of the LAA were increased with increasing $CHADS_2$ risk score of AF patients, while emptying rate were decreased. Compared with non-thromboembolic patients, events subgroup exhibited deeper depth (2.85±0.57cm vs 2.55±0.53cm, P=0.045) and bigger end-diastolic volume (7.39±3.47ml vs 5.21±2.59ml, P=0.003). Logistic regression showed that LAA orifice (P=0.024, OR 0.032, 95%CI 0.002 to 0.640), end-diastolic volume (P=0.004, OR 1.522, 95%CI 1.142 to 2.030) or cauliflower (P=0.002, OR 10.945, 95%CI 2.406 to 49.798) was independent predictors for thromboembolic events in patients with AF after adjusting for $CHADS_2$ score.

CONCLUSIONS Depth and end-diastolic volume were increased in thromboembolic patients, and LAA orifice, end-diastolic volume or cauliflower can predict thromboembolic events of AF patients independent of the $CHADS_2$ score. Further prospective investigations are needed to elucidate whether these indices affect clinical outcome.

GW26-e4533

Electrocardiogram score for the selection of reperfusion strategy in early latecomers with ST-segment elevation myocardial infarction

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OBJECTIVES The clinical benefit of percutaneous coronary intervention (PCI) is controversial in ST-segment elevation myocardial infarction (STEMI) patients presenting 12-72 hours after symptom onset. Several studies suggested this conflicting result was associated with myocardial area at risk (MaR) of enrolled patients. MaR could be estimated by the electrocardiogram (ECG) score. Our objective was to evaluate the benefits of PCI in STEMI latecomers with different MaR.

METHODS We constructed a prospective cohort involving 436 patients presenting 12-72 hours after STEMI onset and who met an inclusion criteria. 218 underwent PCI and 218 received the optimal medical therapy (OMT) alone. Individual MaR was quantified by the combined Aldrich ST and Selvester QRS score. The primary endpoint was a composite of cardiovascular death, reinfarction or revascularization within two years.

RESULTS The 2-year cumulative primary endpoint rate was respectively 9.2% in PCI group and 5.3% in OMT group when MaR $<$ 35% (adjusted hazard ratio for PCI vs. OMT, 1.855; 95% confidence interval [CI], 0.617-5.575; P = 0.271), and was 12.8% in PCI group and 23.1% in OMT group when MaR $\geq$ 35% (adjusted hazard ratio for PCI vs. OMT, 0.448; 95% CI, 0.228-0.884; P = 0.021).

CONCLUSIONS The benefit of PCI for the STEMI latecomers was associated with the MaR. PCI, compared with OMT, could significantly reduce the 2 - year primary outcomes in patients with MaR $\geq$ 35%, but not in ones with MaR $<$ 35%.

GW26-e4452

The effect of renin-angiotensin system inhibition on the ectopic rhythm in elder hypertensive patients

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OBJECTIVES To investigate the therapy effect of renin-angiotensin system inhibitors on the ventricular or supraventricular ectopic rhythm of the older hypertensive patients.

METHODS 209 subjects with no less than 720 ventricular or supraventricular premature beats by 24 hour Holter monitor were included and randomly divided into the RAS inhibitor group and the control group. The control group received routine anti-arrhythmia treatment including magnesia and potassium mixture, β blocker, calcium channel blocker (diltiazem), anti-arrhythmia drugs, nitrate esters, trimetazidine and Traditional Chinese Medicine. The RAS inhibitor group received routine treatment and RAS inhibitors (ACEI or ARBs). Holter monitor were carried after averagely 3.02±0.42 m treatment. The frequency of ectopic rhythm was analyzed.

RESULTS There was no significant difference of the baseline (epidemiology, Blood pressure level, frequency of ectopic rhythm) and the routine treatment between the two groups (P>0.05). After treatment, the frequency of premature ventricular contractions of the two groups [the control group (6159.04±1435.00) *vs* (3979.25±1205.37), P <0.05, RAS inhibitor group: (6479.55±1344.21) *vs* (3123.52±1876.19), P <0.05.] were decreased as well as that of ventricular tachycardia[the control group: (17.85±3.98) *vs* (13.12±8.4), P <0.05, RAS inhibitor group: (19.44±8.18) *vs* (7.69±3.07), P <0.05]. The change rate between the baseline and after treatment in the RAS inhibitor groups was more significant than that of the control group [PVC: (61.70±24.96) % *vs* (41.79±16.26) %, 95%CI: 19.62～70.19, P <0.05, VT: (082.17±37.15)% *vs* (43.12±83.32)%, 95%CI: 20.37～-86.21, P <0.05]. The frequency of PSVC [(378.66±112.44) *vs* (99.01±78.24), P <0.05] and SVT [(21.41±2.97) *vs* (8.92±4.30), P <0.05] were significantly decreased after treatment in the RAS inhibitor group; the frequency of SVT [(17.85±3.98) *vs* (13.36±5.17), P <0.05] significantly decreased while premature supraventricular contraction slightly increased [(359.33±141.09) *vs* (396.95±192.11), P >0.05] after treatment in the control group. The change rate between the baseline and after treatment the in the RAS inhibitor group was more significant than that in the control group [PSVC: (66.60±40.22)% *vs* (-8.72±16.23)%, 95%CI:-15.15～69.50, P <0.05] and [PSVT: (46.48±16.23)% *vs*(13.69±21.33)%, 95%CI: 10.43～-55.15, P <0.05]. The average frequency of the ectopic rhythm per hour reduced after treatment in both the RAS inhibitor group and the control group were [(699.20±309.93) *vs* (211.05±139.220), P <0.05] and [(708±203.77) *vs* (369.31±95.64), P <0.05]. The change rate between the baseline and after treatment in the RAS inhibitor group was significant compare with that of the control group [(59.15±22.03)% *vs* (22.77±23.64)%, 95% CI: 23.06～89.71, P <0.01].

CONCLUSIONS The frequency of the ventricular and supraventricular ectopic rhythm could be decreased by RAS inhibition in elder hypertensive patients.

GW26-e1055

Associated factors of QT interval in healthy Chinese population

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OBJECTIVES The aim of this was to evaluate the associated factors of QT interval in normal aging process in order to improve the early cardiovascular risk assessment in healthy population.

METHODS We examined 4000 apparently healthy community dwelling subjects in three Chinese cities, and 1049 healthy subjects were recruited and examined. Blood pressure, blood biochemical parameters, and cardiovascular ultrasonography were assessed. Pearson correlation analysis and multiple stepwise regression analysis were used to examine the relationship between QT interval and associated variables.

RESULTS The strongest correlation was found between QT interval and left atrial volume (r=0.215, p<0.001), followed by MVE-DT (r=0.161, p<0.001). QT interval was negatively correlated with left ventricular ejection fraction (-0.106, p=0.001). The stepwise